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Diagnostic Testing: ECG Exercise and Sports

LEFT VENTRICULAR DIMENSIONS DERIVED BY ECHOCARDIOGRAPHY CORRELATE WITH BODY MASS INDEX IN A LARGE POPULATION OF MULTIETHNIC ATHLETES SCREENED IN THE TEXAS ADOLESCENT ATHLETE HEART SCREENING REGISTRY (TAAHSR)

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Background: Left ventricular (LV) dimensions have been described to relate to body mass index (BMI) in populations that are of limited size and diversity. Large sample data focused on adolescent athletes and diverse ethnicity are lacking to date.

Methods: Cross-sectional observational study of athletes 14-18 years screened at TAAHSR events: History, 12-lead ECG and limited 2D Echo were performed. Dimensions for the LV and measures of LV function were obtained by M-mode: LV end-diastolic dimension (LVEDD), LV end-systolic dimension (LVESD), interventricular septal diastolic thickness (IVSDT), LV posterior wall diastolic thickness (LVPWDT), ejection fraction (EF) and shortening fraction (SF). Mean and SD were calculated for each measure in all and in predominant ethnicities. Results were stratified across BMI categories and compared using analysis of variance (ANOVA) and analysis of covariance (ANCOVA).

Results: 1,580 athletes were screened between 03/2010 and 07/2011 (68% males, 72% BMI≤85%, 63% White, 24% Hispanic, 7% African American). Values are seen below according to BMI:

	All (n=1580)		BMI <85% (n=1152)		BMI 85%-95% (n=214)		BMI >95% (n=214)	
	mean	sd	mean	sd	mean	sd	mean	sd
LVEDD (cm)	4.73	.50	4.65	.47	4.86	.50	5.03	.49
LVESD (cm)	2.79	.38	2.75	.37	2.86	.38	2.96	.36
IVSDT (cm)	.84	.14	.82	.13	.88	.14	.92	.14
LVPWDT (cm)	.83	.14	.81	.14	.87	.13	.90	.14
EF %	71.68	5.94	71.78	5.87	71.28	6.70	71.53	5.52
SF %	41.03	5.62	40.97	5.70	41.14	5.57	41.24	5.24

All LV measurements were significantly different across BMI categories and ethnicities ($p<0.01$), but measures of function were similar ($p>0.05$). These findings were maintained when controlling for age of participant.

Conclusion: Measures for LV dimensions correlate with BMI in an ethnic diverse adolescent athlete population. Further studies are needed to determine the value of normative data in different ethnicities.